

**IMPLEMENTATION OF COOPERATIVE LEARNING MODEL NUMBER
HEAD TOGETHER (NHT) TYPE WITH MASTER CHEM GAMES
ON BUFFER SOLUTION MATTER OF GRADE XI
AT SMA NEGERI 1 TUBAN**

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Abstract

The aims of this study are to know the carrying out of implementation of cooperative learning Number Head Together (NHT) type with Master Chem games on buffer solution matter and student's learning outcomes. The research method that used pre experimental design, one shot case study. The result observation of caring out cooperative learning NHT type from first meeting until third meeting in series that are 4.23, 4.10 and 4.43 on very good category. The clasically student's mastery learning of XI IPA 2 SMA Negeri 1 Tuban is increased in series that are 83,9%, 93,8% and 96,77% from first to third meeting. It can be conclude that cooperative learning NHT type carried out in the overall learning on very good category and clasical student's mastery learning is achieved.

Keywords: cooperative learning NHT type, Master Chem games, student's learning outcomes

Abstrak

Tujuan dari penelitian ini adalah untuk mengetahui keterlaksanaan model pembelajaran kooperatif tipe *Number Head Together* (NHT) dengan media permainan *Master Chem* pada materi larutan penyangga dan hasil belajar siswa. Metode penelitian yang digunakan adalah Pra Eksperimen, *one shot case study*. Hasil pengamatan implementasi model pembelajaran kooperatif tipe NHT dari pertemuan pertama hingga ketiga berturut-turut yaitu sebesar 4,23; 4,10 dan 4,43 dengan kategori sangat baik. Ketuntasan klasikal hasil belajar siswa kelas XI IPA 2 SMA Negeri 1 Tuban mengalami kenaikan yaitu 83,9%, 93,8% dan 96,77% dari pertemuan pertama hingga ketiga. Disimpulkan bahwa implementasi model pembelajaran kooperatif tipe NHT secara keseluruhan sangat baik dan ketuntasan klasikal hasil belajar siswa tercapai.

Kata kunci : model pembelajaran kooperatif tipe NHT, permainan *Master Chem*, hasil belajar siswa

INTRODUCTION

The government's efforts to improve education quality in Indonesia is set the curriculum 2013. The aims curriculum 2013 to prepare Indonesian people that have the ability to life as individuals and citizens who believe, productive, creative, innovative, affective and able to contribute to society, nation, state, and civilization of the world [1]. The curriculum 2013 was developed with the improvement mindset,

that are 1) the pattern of teacher-centered learning into the learner-centered learning. Learners should have the choices of materials studied to have the same competence, 2) the pattern of passive learning into active learning 3) pattern learning itself becomes a learning group (team-based) [1].

Chemistry as a branch of natural science that has very important role in development of science and technology.

Chemistry can be either concept or calculation. Chemistry often felt confusing, boring and requires a high level but in actually students is interested in chemistry. The success of chemistry teaching is determined by student participation in learning, the more activity of student, the more successful of learn activity.

According to the interview with a chemistry teacher of grade XI Science in Public Senior High School 1 Tuban, chemistry lesson through lectures and give individually tasks or in groups. The learning activities are carried out during teamwork, but students are passive, because students are not ready with the material to be studied. This is indicated by the average score of chemistry material in grade XI Science in middle semester 2013-2014, 50% of students get score less than minimum criteria. Teamwork should be able to improve interaction and student learning outcomes. While based on a questionnaire distributed in grade XII IPA 1, students did learn in the group, but 75% of students said that while learn in the group there is student passive and 51% of students consider that in grade XI even semester is difficult.

The learning model is a planning that describes how learning a systematic procedure that can be used as a guide in implementation of learning in the classroom to achieve learning objectives. One of alternative learning model that can be used is cooperative learning model NHT type. Cooperative learning model NHT type is learning model where students teamwork in small groups to help another to increase their learning outcomes and each member is assigned a number in the head. The cooperative learning model was developed to achieve at least 3 important instructional goals: 1) academic, 2) achievement, acceptance of diversity, and 3) social skill development [2].

In the application of learning model that students are motivated and interested in the material that is taught to use learning media. Learning media is a complementary tool used by teachers to

communicate with students. Using learning media in learn to increase desired and new interest, increase motivation and stimulate for learning [3]. One of media to student interest is game. Game can help students understand the subject matter has been given.

Game used is Master Chem. Master Chem game adopted from the famous cooking talent that is Master Chef. Master Chem stands for Master Chemistry or chemist. Master Chem game is a game in groups consisting of 5 until 6 students and member given numbered 1 until 6. Master Chem games consist of two stages that are *Babak Adu Cepat* (Quick Round) and *Babak aku Bisa* (I Can Round). At the *Babak Adu Cepat* (Quick Round), given simple question of material buffer solution, so that every group competed quick answer questions that given by the teacher. If the answer is true to get 1 star. While at the *Babak Aku Bisa* (I Can Round), every group was given the same questions and given time to answer the question was 25 minutes.

There is study that has aims to carrying out and students learning outcomes of cooperative learning model Number Head Together (NHT) type with Master Chem games on Buffer Solution material at grade XI Public Senior High School 1 Tuban.

METHOD

The research had been done use pre-experimental design, One Shot Case Study, the experiments did not comparison group and no pretest.

X → O

X = learn using cooperative learning model NHT type with Master Chem games on buffer solution matter.

O = test to know students learning outcomes in a buffer solution matter [4]

The instruments used are the carried out sheet and test of student learning

outcomes. This method of data collection used observational and test methods.

At the data analysis, to do assessment carried out analysis of cooperative learning model given by observers using the following criteria:

Table 1 Assessment Score of Linkert Scale

Score	Explanation
1	Very bad
2	Bad
3	Medium
4	Good
5	Very good

[5]

If that does not occur, given score is 0. Observational data obtained then is included in the score. As for the formula used:

$$\text{Carring out quality} = \frac{\sum \text{score of avarage observer}}{\sum \text{Aspect observation}}$$

The calculation is done on every aspect of the overall evaluation and assessment. These findings are shared in Table 2:

Table 2 Learning Managemant

Score	Explanation
0.00 – 1.00	Very bad
1.01 – 2.00	Bad
2.01 – 3.00	Medium
3.01 – 4.00	Good
4.01 – 5.00	Very good

[5]

Learning is good quality if they have good or excellent categories.

For the study, the students complete if it has a score of ≥ 80 . Mastery learning classically said as successful in learning if the class contained 80% of the students had completed the study. Was calculated as follows:

$$\text{Individual mastery} = \frac{\text{obtained score}}{\sum \text{maximum score}} \times 100\%$$

$$\text{Clasical mastery} = \frac{\sum \text{achieve student}}{\sum \text{totality student}} \times 100\%$$

RESULT AND DISCUSSION

The carried out observations to do by 2 observers that are one of chemistry teacher at Public Senior High School 1 Tuban and one colleague. Here is the data average carried out observational result of learning model at every meeting:

Table 3 Result about Carring Out of Cooperative Learning Model NHT Type with *Master Chem Games*

Aspect	Score of Meeting		
	1	2	3
Phase 1: Clarify goals and establish set	4.50	3.75	4.50
Phase 2: Present information	4.00	3.75	4.00
Phase 3: organize student into learning teams	4.00	4.50	4.50
Phase 4: Assist teamwork and study	4.60	4.20	4.50
Phase 5: Test on materials	4.10	4.60	4.40
Phase 6: Provide recognition	4.00	4.25	4.25
Time managemant	4.00	3.50	5.00
Anthusiastic teacher	5.00	4.00	4.50
Anthusiastic student	5.00	4.00	4.50
Avarage	4.23	4.10	4.43

Based on the Table 3 above can be seen in the phase 1 has decreased from 4.5 (very good) at the first meeting to be 3.75 (good) at the second meeting. At the second meeting of ± 15 minutes late student learning due to still follow previous learning process and coordination of teacher researchers with previous subjects. Shortage at the second meeting to third meeting can be improvement is successfully increase become 4.5 (very good). Whereas in phase 2 also decrease from 4 (good) to 3.75 (good). Teachers shorten material explanation for a limited time until the material presented less maximum. But in the third meeting can be

improved so as to increasing assessment is 4 (good).

Phase 3 is to organize students into learning groups, researchers obtained are 4 (good), 4.5 (very good) and 4.5 (very good) at the meeting of 1, 2 and 3. This suggests that ability of teachers to organize students into groups assessed has increased. Grouping of students at the first meeting base on chemistry teachers informed Public Senior High School 1 Tuban and daily test score of previous material, but on the second and third meetings based on test scores 1 and 2. With this it of the group that formed is heterogeneous and has different levels of ability. This is accordance with the cooperative learning that is a model of learning in which students learn and work in small groups in a collaborative whose members consist of 4 to 6 people, with a heterogeneous group structure [6].

After the teacher organizes students in groups, the teacher asked a question in the form of worksheets which contains practice questions. Every group discussion for do exercises. The aim of teamwork is prepare member of group to succeed or ready answer questions during games. Student are better able to help the other student and member of group contribute achievement to group [7]. Directly students also get a chance to socialize among friends. While students work in groups, teachers guide students to work and learn in around every group. Assessment of Phase 4 is to guide students to work and learn in a group is very good that are 4.6, 4.2 and 4.5 at the meeting of 1, 2 and 3. Although the second to meeting is decrease but the third meeting, it can be fixed.

While the results of management time, enthusiastic teachers and students can be shown in Figure 1

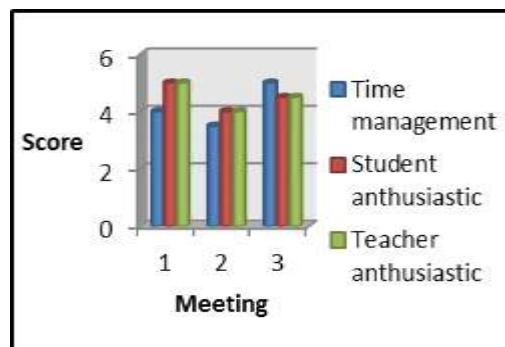


Figure 1 Diagram Result of Time Management, Anthusiastic Teacher and Student

Enthusiastic students shown in the figure below when students play on Master Chem game at *Babak Adu Cepat* (Compe Quick Round) in the first meeting.



Figure 2 Anthusiastic Student In The Master Chem Game at *Babak Adu Cepat* (Quick Compe Round)

It can be concluded that the cooperative learning model NHT type with Master Chem game overall at the meeting 1, 2, and 3 in series that are 4.23, 4.10 and 4.43 on very good category.

Based on the curriculum at Public Senior High School 1 Tuban in chemistry lessons is learned there are criteria mastery learning of individuals and classical. A student called masterly studied when he achieve a score of ≥ 80 , whereas in the classically of a class is achieve if 80% from students obtaining a score of ≥ 80 .

Here is a diagram mastery of student learning outcomes after implementation of

cooperative learning model NHT type with Master Chem games.

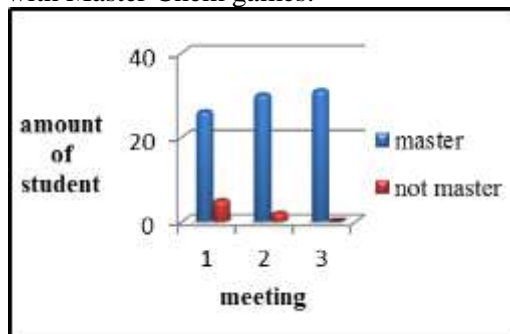


Figure 3 Diagram Developments of Student Learning Outcomes

Data of student learning outcomes at grade XI Science 2 on buffer solution material, showing that student individual mastery from first to third meeting is increased that are 26 students (83.9%), 30 students (93.8%) and 30 students (96.77%). While students have not attend from the first meeting to last on series are 5, 2 and 1. At the first and third meeting there is one student did not attend, so the classical mastery is calculated based on students are attend in the learned. In classically, cooperative learning model NHT type with Master Chem games is achieved.

CLOSURE

Conclusion

The conclusion of this study are:

1. The quality of cooperative learning model NHT type with Master Chem games on buffer solution matter XI grade at Public Senior High School Tuban have been very good and has increased the average score of a given observer at the first to third meeting on series that are 4.23, 4.10, and 4.43.
2. The classically of student learning outcomes is increase from the first to third meeting on series that are 83.9%, 93.8% and 96.77% with minimum criteria is 80.

Suggestion

Based on the conclusion have been made, the overall aims has been achieved. However, there is to be recommended for further study.

1. Pay attention of time management because the game is many time.
2. Needed control the condition of game to give reward in well regulated and anthusiasm group.
3. Needed presence the referee and students for assist teachers to determine the position of group.

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